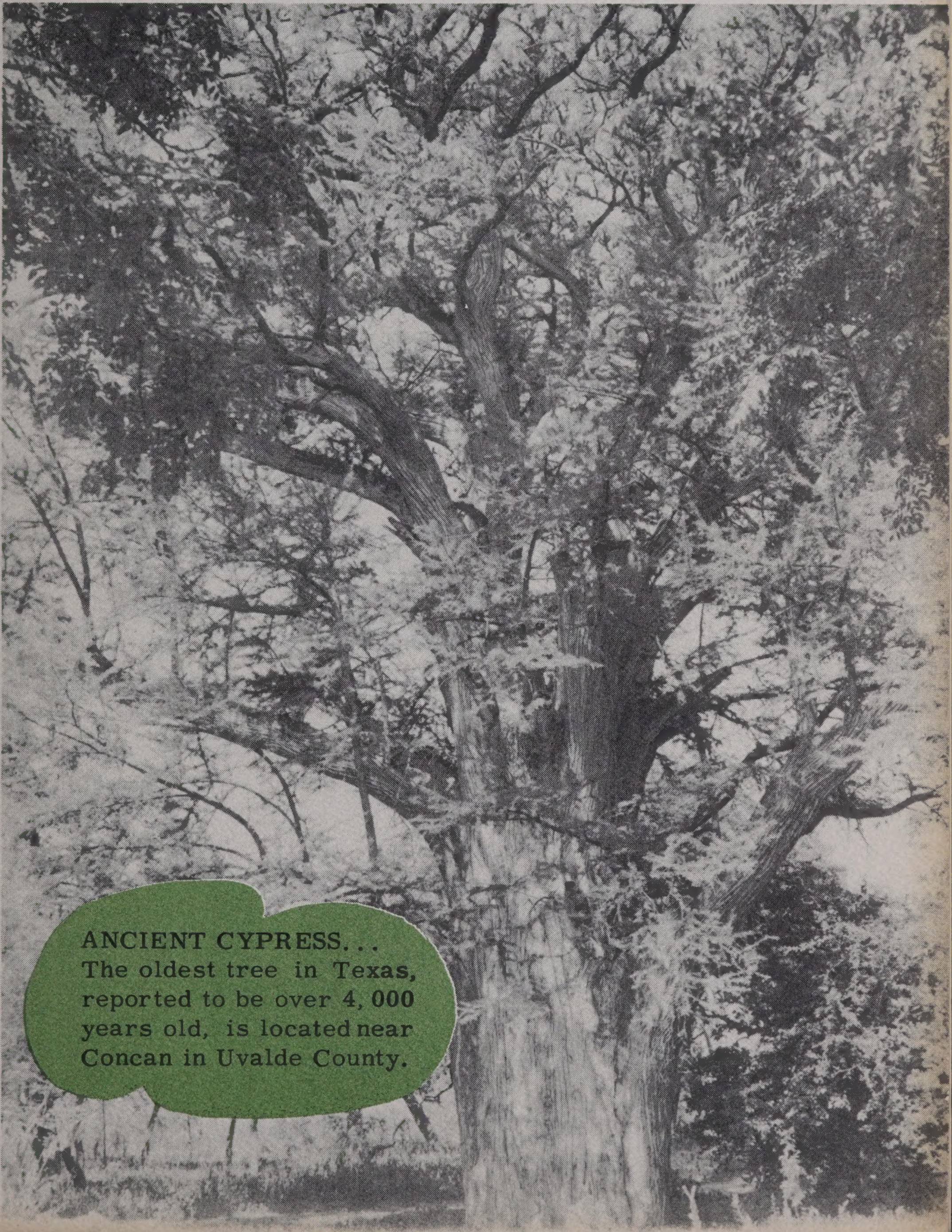
TEXAS HIGHWAY DEPARTMENT

Construction & Maintenance

BULLETIN No. 16

Oct, 1952



ANCIENT CYPRESS. . .
The oldest tree in Texas,
reported to be over 4,000
years old, is located near
Concan in Uvalde County.

Foreword

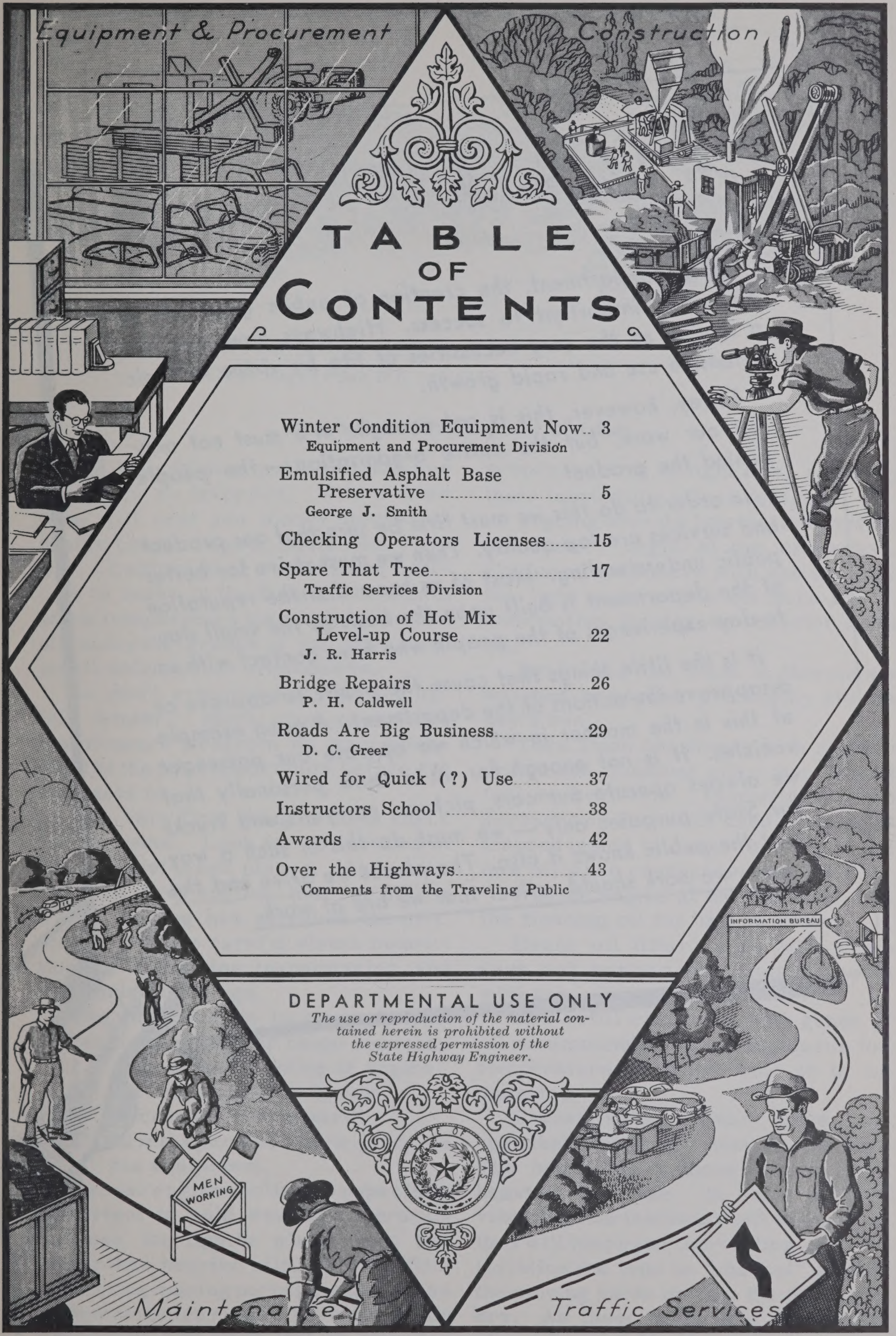
This bulletin is published for the purpose of presenting practical information applicable to current highway problems. These conclusions and data are not necessarily endorsed by the Highway Department nor are they to be construed as instructions. Employees are invited and urged to submit suggestions and relate experiences which would benefit those engaged in the construction and maintenance of highways.

Photographic services are available and other assistance may be obtained if desired in preparing material for submission. All material and comments should be directed to the Chief Engineer, Construction & Maintenance, Austin, Texas.

Published Jointly by

Maintenance Division	**D- 3**
Equipment & Procurement Division	**D- 4**
Construction Division	**D- 6**
Traffic Services Division	**D-16**

COMPILED AND EDITED
INFORMATION SECTION,
TRAFFIC SERVICES DIVISION
REPRODUCED
OPERATIONS DIVISION
TEXAS HIGHWAY DEPARTMENT
AUSTIN 14, TEXAS



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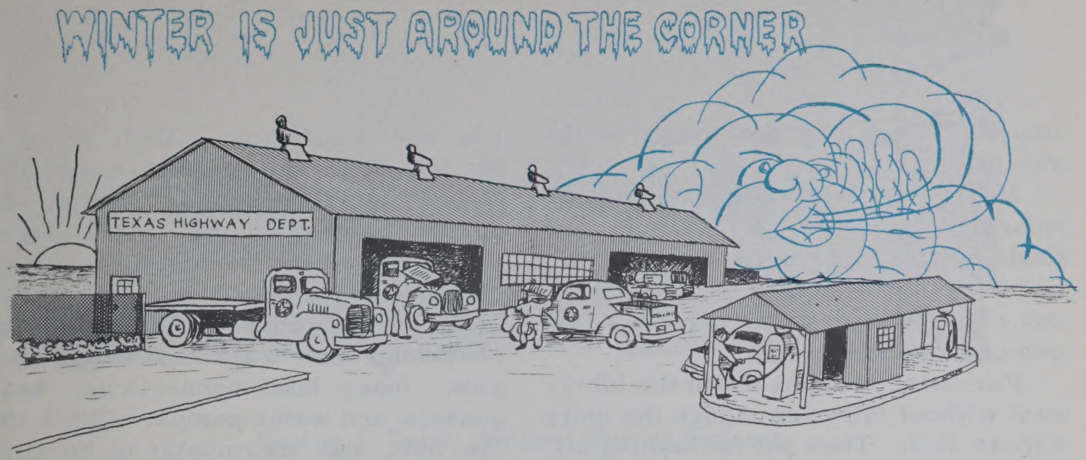
As We See It

In the department, the creation of public good will is especially important to success. Highways have become a symbol of the very necessities of life by virtue of their extensive use and rapid growth.

Today, however, this is not enough. We must not only sell our work, but the entire organization — the people behind the product.

In order to do this we must first be sure that our product and services are top quality. Then we must strive for better public understanding. Most of us know that the reputation of the department is built upon the basis of the small day-to-day experiences of the people who have contact with us.

It is the little things that cause the public to approve or disapprove the actions of the department. A good example of this is the manner in which we operate our passenger vehicles. It is not enough for us to know personally that we always operate our cars, pickups, carryalls and trucks for State purposes only — we must do this in such a way that the public knows it also. The places we drive and the places we park should reflect that we are at work.


WINTER IS JUST AROUND THE CORNER
TEXAS HIGHWAY DEPT.

WINTER CONDITION YOUR EQUIPMENT - NOW

Equipment and Procurement Division

Old Man Winter pulls no punches and plays no favorites. Winter down time will cost you money unless you winter condition your equipment right now. Cold weather repairs are difficult to make in the field. The strain of low temperature starting and the use of incorrect grades of oil often turn small defects into breakdowns.

So don't even try just "getting by" this winter. Start your preventive maintenance program on your equipment at the first opportunity before the cold sets in.

The very first thing to do is check for oil leaks. Look for collections of new oily dirt in odd places. And in the case of a dirty engine, look for places where leaking has streaked the dirt. Make the same careful visual inspection of the engine transmission and final drive housings.

The next step is to clean the unit and engine -- for four basic reasons:

1. Aids proper cooling of engine
2. Oil leaks show up faster
3. Decreases fire hazard
4. Gives operator more pride in his equipment.

Proper engine cooling is especially important in cold weather operation because the lighter winter oils run hotter than heavier oils. The oil film protecting moving parts gets thinner as oil temperature rises. Therefore, any crankcase dirt pack left on impedes proper cooling of light oils, reducing their lubricating effectiveness.

In going over the lubrication system for winter, begin at the crankcase. Engine oil gets heavy with use because the light ends of the oil burn off in combustion leaving the heavier base oil.

Drain old oil from a thoroughly warmed-up engine, preferably after a day's run.

Then flush crankcase with regular crankcase flushing oil -- not Diesel fuel or kerosene. (Sometimes when kerosene or Diesel is used, enough is trapped inside to cause foaming of the new oil when crankcase is refilled.)

Run the engine at half-throttle with the flushing oil for half an hour.

Drain oil filter, wipe with clean rags and replace old filter elements with new.

Now refill crankcase with grade of oil recommended by manufacturer for temperature at which unit is to be operated.

Transmission, final drive and sprocket drive are next on the list. The lubricants in these units become heavier with use. In fact, if high viscosity lubricants are left in too long, they will lose good lubricating characteristics and tend to "channel" around the moving parts so that the parts run dry. As these units heat up in use, dirty oil on outside of housing is sucked inside through any seal leaks or the ventilator.

Metal-wear particles also become mixed in lubricant. If there is any doubt of this, magnetize a rattail file and stick it in the housing. It will come out covered with metal particles that can cause serious wear.

For these reasons drain the lubricant without fail even though the units appear full. Then put in flushing oil, not kerosene or Diesel fuel, and run the unit fifteen minutes, not under load. Drain or refill in accordance with manufacturer's recommendation.

Follow this with a complete chassis lubrication. Wipe off excess lubricant. It gathers dirt and is sometimes drawn back into lubricated point by heat. This causes rapid wear.

Clean battery terminals with solution of warm water and baking soda using a wire brush. Dab grease on terminals and tighten them.

Also check specific gravity of cells with hydrometer. Water level should be brought up with distilled water. Continual low water in battery is an indication of an overcharge condition.

Voltage regulator, starter and generator should be checked, tested and adjusted.

For fast starts and peak efficiency during winter, there's nothing more important than proper adjustment of the combustion system. Start by cleaning plugs and properly spacing the gap. Check all spark plug wires and connections.

Adjust or replace distributor points as needed.

Don't overlook the air cleaner. It should be removed and disassembled. Wash out with Diesel fuel or kerosene. Reassemble and fill with recommended grade of oil, usually the same as that used in crankcase.

Be sure to check all air cleaner connections to inlet manifold. See if leaks are indicated and make repairs where necessary.

Check the cooling system before you add antifreeze. Most of your antifreeze losses are the result of a faulty and leaky cooling system. To assure proper engine performance, the system must be kept clean and in good operating condition.

So before cold weather sets in, check the system for rust and corrosion, leaky hose connections, head gaskets and water pumps. Check the fan belt, and thermostat to be sure both are in good operating condition.

Follow through on your regular Preventive Maintenance schedule with a periodic check up of the cooling system. Check for loose connections and faulty hose and fan belts. This assures continued savings on operating costs.

To insure proper combustion and lubrication, clean the complete engine ventilation system including crankcase breather on side of engine, breather pipe and elbows on top of valve cover. This step is important because these pipes take out condensation which often causes corrosion and failure of valve springs and rocker arms. This is one precaution that should be underlined. Furthermore, it is recommended that engine ventilating systems be checked frequently during cold weather operation.

Avoid parking equipment in exposed place for long period without running. If necessary to keep it out in winter, run it at least once every day.

Fill fuel tanks at end of work day to prevent collection of moisture.

Store in dry and protected place.

Thoroughly wash and clean unit.

Completely lubricate unit. Drain fuel tank, water trap and fuel filters; open air vents to secure complete drainage.

Drain all water from cooling system.

Drain all gasoline from gas tank, strainer bowl and carburetor.

With these simple precautions, your equipment will last longer when Old Man Winter's chips are down.

Emulsified Asphalt Base Preservative

George J. Smith, Assistant District Engineer
District 8

This report is on the use of Emulsified Asphalt - HVMS mixed with water as a method of preserving a finished flexible base under traffic until such time as the asphalt surface can be economically applied.

The principle is not new. An emulsion solution has been used successfully by the City of Austin in maintaining their unpaved streets. The emulsion is mixed with water to eliminate dust, thereby reducing the cost of sprinkling considerably. However, the use of such a solution in highway work offers a number of possibilities in reducing the cost of the construction of flexible base with asphalt surface.

The project on which this material was used is F. M. 1082, located in Jones County and extending from the Taylor County line to Lake Fort Phantom Hill Dam, a distance of 7.2 miles. The plans for this project provided for the grading, structures, and flexible base to be constructed by contract, and the single asphalt surface to be placed by state forces. Asphalt quantities shown on plans were as follows:

Prime - .15 gallon per square yard, EA-HVMS
Surface - .4 gallon per square yard, O. A. 135
Aggregate - 1 cubic yard per 85 square yards Type A, Grade 3

This project was experimental insofar as the prime was concerned since data on quantity and methods of application were not available, and was performed in cooperation with File D-14.

During the process of hauling, placing, and manipulating the flexible base and prior to the start of final finish on the roadway, the base was losing considerable amount of soil binder because of extremely dry weather and an unusual amount of traffic to and from Lake Fort Phantom Hill. This occurred even though a large amount of maintenance sprinkling was used by the contractor.

Final finish operations were started on the north end of the project and a very tight, hard-finish surface was obtained due to the characteristics of the base material which were as follows:

Caliche Gravel
Usual PI-10, LS-6 and Usual Soil Binder 25%

After the first two miles of base were completed, it was apparent that it would be necessary to start work immediately on priming or preserving the surface since it would not be practical to maintain the base with sprinkling until the contractor could complete the entire job. State forces then moved in with a 1,000-gallon water truck, two 50-gallon barrels, one asphalt pump to unload the asphalt from the transport, two 2,000-gallon storage trucks, and one water pump. The emulsion was drawn by gravity and at air temperature into the 50-gallon barrels, which were calibrated for measurement purposes, and then pumped into the empty water truck. The water truck was then filled with water. The action of the water being pumped into the truck was found to thoroughly mix the emulsion with the water. Complete loading of the truck normally required about ten minutes.

The first application tried was a mixture of 75 gallons of EA-HVMS and 925 gallons of water, with the water truck traveling at a speed of ten miles per hour. Rate of application, of course, depended on spray bar arrangement. This rate of application was too heavy since some of the mixture was running off the crown. The speed of the truck was increased to fifteen miles per hour and the first mile was treated with one application of 7.5 per cent mixture. On the second mile a 5.0 per cent mixture was used, making two applications since some tendency of the emulsion to pick up under traffic for a short period after being applied had been observed on the first mile. All "dusting out" of the base was stopped immediately. A very thin membrane of asphalt, slightly less than one-sixteenth inch, was left on the surface. This cured out rapidly and had no tendency to be "sticky" after curing. Under traffic the surface ironed out smooth in the same manner that the base had done with correct moisture content, except that a durable membrane of asphaltic material remained. This two-mile section of road was treated on July 2, and remained open to traffic at all times until the surfacing was applied on July 15. Spotting with additional applications on curves and steep grades was necessary at intervals where raveling tried to start. On the first mile, the total amount of emulsion applied, including all maintenance spotting, was at the rate of .06 gallon per square yard.

On two sections of the road an attempt was made to work the emulsion mixture into the top portion of the base by applying the mixture instead of plain finishing water as the last windrow of base material was laid in and compacted. Results of this operation were not promising since the amount of residual asphalt in the mixture was not sufficient to act as a stabilizing agent. Further attempts at stabilization were not made since that was not the purpose of this experiment. On a more sandy type of base material this method would probably help considerably in obtaining a satisfactory finish on the base if the amount of emulsion used in the mixture was increased.

On most of the project the 5 per cent solution was used in repeated applications, usually two initial applications which left about .03 gallon of emulsion per square yard, with subsequent maintenance applications which would add about .03 gallon, making a total of .06 gallon of emulsion per square yard for a normal section. A total of 134 M gallons of water and 7,050 gallons of EA-HVMS was used for the entire 7.2 mile project, with the usual period of preservation being two weeks. The treatment was applied full crown width, which was 22 feet. The average rate of application for the total project, including all emulsion used on various sections, was .077 gallon per square yard.

On the south end of the project a section 1,700 feet long was treated in the usual manner with a 0.26 gallon per square yard application of MC-1 prime, so that a comparison might be made of the performance in the future of the emulsion base preservative and the usual MC-1 prime.

The application of the surface course, .4 gallon per square yard of OA-135 covered with Type A, Grade 3 aggregate at the rate of one cubic yard per 90 square yards was completed on July 22. On the date of this report, August 20, there is no evidence of bleeding on the MC-1 primed section or the balance of the road on which the emulsion was used; however, on the MC-1 section the asphalt has flushed very close to the surface of the aggregate. Cutting into the surface shows the MC-1 section to have a penetration into the base of asphaltic materials of about one-fourth inch. The section treated with emulsion shows practically no penetration into the base, but it does have a very strong bond to the surface of the base.

CONCLUSION: With tight base materials the use of EA-HVMS as a base preservative should have the following advantages on highway construction:

1. Enable the builder to pin down and hold the finished base surface as it is completed, even under traffic.
2. Eliminate the need for keeping traffic off the finished base.
3. Eliminate entirely the use of an asphalt distributor until the whole project is complete and ready for the surface.
4. Eliminate the waiting period on the usual prime coat curing.
5. Reduce the time to be spent on a project by the asphalt distributor and crew.
6. Reduce the cost of maintenance sprinkling.
7. Reduce the cost of prime coat by two-thirds since approximately one-third of the asphaltic material usually used on a prime would be sufficient for the base preservative. This is assuming that the cost of handling the emulsion would not be greater than handling cost of a prime and that the water used would not be in excess of that normally used in maintenance and finishing, and preparing base for prime.

The operation described above does not provide the penetration into the base which is obtained by the MC-1 prime coat, but it does provide a strong bond to the surface of the base.

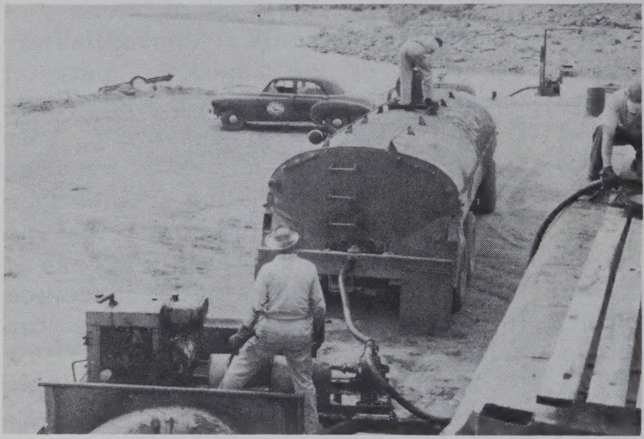
The following pages present a pictorial report illustrating the simplicity and the economy of using Emulsified Asphalt (EA-HVMS) for one of a number of possible beneficial services. On this project, the Emulsified Asphalt was diluted with water to form solutions containing from 5 per cent to 10 per cent of Emulsified Asphalt.

In the case of the experimental project illustrated, the "Diluted Emulsion" was used for a dual purpose, namely (1) a tack coat for an asphalt surface treatment, and (2) an economical method of maintaining the finished condition of a flexible base subjected to traffic, in an arid climate, for a length of time sufficient to permit the orderly and economical placement of the asphalt surface treatment.

The cost of this maintenance, if accomplished by the usual method of sprinkling, was estimated to be about $0.048 per square yard in this instance. The cost of this maintenance, if accomplished by the usual method of applying a Cut-back Asphalt (MC-1) Prime, was estimated to be about $0.039 per square yard. Maintenance, in this case, with "Diluted Emulsion" at probable bid prices costs $0.012 per square yard. In addition, the "Diluted Emulsion" provided an excellent "tack coat" and its application in no way seriously interfered with the use of the road by traffic.

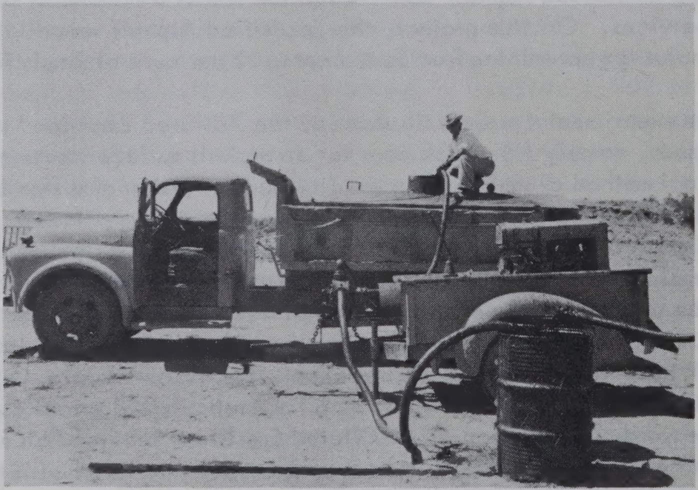
SERIES I

This series of pictures illustrates the receiving, storage, measurement, and dilution of the Emulsified Asphalt (EA-HVMS). The simplicity of handling this material is evidenced by the three pieces of low-cost equipment involved.



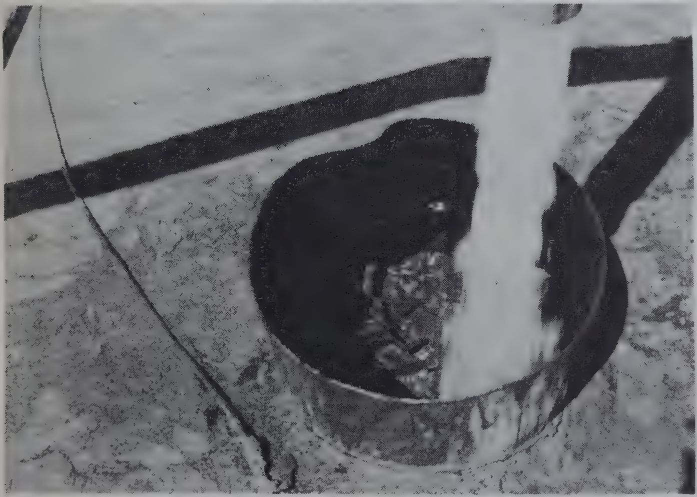
Transferring EA-HVMS from refinery's transport truck to job storage tank.

Gravity flow of EA-HVMS (without heat) from storage tank to calibrated measuring drums. (One 50-gallon drum of EA-HVMS to 950 gallons of water = 5 per cent solution, etc.)



Pumping measured volume of EA-HVMS from measuring drum into ordinary sprinkler tank.

Adding water to the EA-HVMS. No special arrangements for mixing need be made as the EA-HVMS readily mixes with the water. As the tank fills with water, it is necessary to gradually reduce the force of the water - input to avoid "boiling over."



"Diluted Emulsion" does not appear to affect the sprinkler tank or its operation.

This series of pictures illustrates the application and usage of "Diluted Emulsion" in conjunction with the finishing operations on the flexible base. The flexible base was shaped and rolled except for the final blading across and rolling of a small windrow

Rolling flexible base. Note small windrow of base material on right reserved for final blading.

Initial application of a 10 per cent solution of "Diluted Emulsion." Note small windrow of base material on right reserved for final blading. This application of "Diluted Emulsion" amounted to .047 gallon of EA-HVMS and .420 gallon of water per square yard. It dried sufficiently for final blading and rolling in about fifteen minutes. Traffic can be and was permitted to travel over the freshly applied "Diluted Emulsion."

Final blading and rolling of the flexible base.

of base material. The initial application of "Diluted Emulsion" was applied and as soon as this had dried sufficiently, the final blading and rolling was completed. This work was followed with a second application of "Diluted Emulsion."

Completed flexible base after fine-grading and final rolling.

Second application consisting of a 5 per cent solution of "Diluted Emulsion" has been applied. This application amounted to .016 gallon of EA-HVMS and .451 gallon of water per square yard. Subsequent supplementary applications aggregating .022 gallon of EA-HVMS and .418 gallon of water per square yard were sufficient to maintain this surface under traffic for fifteen dry, hot days.

Completed "Diluted Emulsion" treatment. Tank truck hauled water for contractor's operations over the treatment without interruption.

SERIES

This series of pictures illustrates the use of "Diluted Emulsion"

A surface application of 5 per cent solution of "Diluted Emulsion." The width of each shot was about eight feet and three parallel shots were required. The truck was traveling 30 m.p.h. which resulted in 0.01 gallon of EA-HVMS per square yard. Repeated applications were made until an aggregate of 0.052 gallon of EA-HVMS and 0.988 gallon of water per square yard had been applied. Subsequent applications of 5 per cent solution aggregating 0.016 gallon of EA-HVMS and 0.304 gallon of water sufficed to maintain the finished base, under traffic for fifteen hot and dry days.

Surface application of 5 per cent "Diluted Emulsion" partially cured. Note tracks left by truck which practically followed tank making application.

as a surface application only on the completed flexible base.

"Close-up" showing traffic tracks on freshly applied 5 per cent solution of "Diluted Emulsion." On one section the freshly applied "Diluted Emulsion" was rolled with a pneumatic-tired roller until cured.

View of flexible base treated by surface applications of a 5 per cent solution of "Diluted Emulsion" taken after it had been under traffic for seven days. This treatment aggregated 0.072 gallon of EA-HVMS and 1.371 gallons of water per square yard. The scaling apparent in the left foreground occurs where hauling trucks turned on and off of the project. This scaling is not a serious item and appears to occur most frequently where a surplus of soil-binder exists. A subsequent light application of "Diluted Emulsion" will suffice to coat these areas.

SERIES IV

This series of pictures illustrates the contrast in "Diluted Emulsion" applications and the usual Cut-back Asphalt (MC-1) Prime application.

Traffic over a fresh application of 5 per cent "Diluted Emulsion." (Note the puddles of "Diluted Emulsion" still on the surface). If the speed of vehicles is temporarily (about fifteen minutes) reduced, there appears to be no significant damage to vehicles. The resultant film of residual asphalt will be less than 0.06 gallon per square yard and therefore is not likely to cause significant "bleeding" in the asphalt surface treatment.

View of a fresh application of MC-1 (0.26 gallon per square yard). It is necessary to detour traffic until such prime has cured. In hot, dry areas such detours are apt to be dusty, dangerous, and uncomfortable. The resultant 0.13 gallon per square yard of residual asphalt may cause "bleeding" of the subsequently placed asphalt surface treatment.

AN EFFECTIVE METHOD OF

CHECKING OPERATORS' LICENSES

District 2 completed on August 14, 1952, their check of the operators' licenses in compliance with Administrative Order No. 22-52.

Following are the form and circular letter used by this District to make this check.

TEXAS HIGHWAY DEPARTMENT
____________________Supervisor

Name	I have a Texas Operator's License which Expires	I have a Texas Commercial Operator's License which Expires	Signed
Peat Oneal	No	10-1-52	Peat Oneal
J. E. Jones	No	9-6-52	J. E. Jones
W. R. Buffington	No	10-3-52	W. R. Buffington
Sam Pearson	No	6-4-53	Sam Pearson
Roy Kerr	No	3-24-53	Roy Kerr
J. W. Thompson	No	4-24-53	J W Thompson
Billy Garrison	No	12-11-52	Billy Garrison
Sam B. McClure	No	11-20-52	Sam B. McClure
E. F. Scott	No	4-9-53	
R. W. Nobles	No	12-21-52	R. W. Nobles
J. L. McClure	No	6-27-53	J. L. McClure
H. W. White	No	1-11-53	H W White

TEXAS HIGHWAY DEPARTMENT
Fort Worth, Texas
July 30, 1952

CONSTRUCTION CIRCULAR NO. 74
MAINTENANCE CIRCULAR NO. 49

TO: ALL SUPERVISORS

SUBJECT: Operators' Licenses

Gentlemen:

It has just been called to our attention by Administrative Order No. 22-52 that another piece of State equipment has been involved in an accident in which our driver did not possess an operator's license. This is very embarrassing and cannot be easily explained. It is requested that you immediately check the license situation of all of your employees and have them bring their licenses up to date if necessary. This will require that each of your employees make a statement as to the status of his licenses on the attached form, which has space available for 12 employees on each sheet. It is further desired that you personally check the licenses and make sure that the operator has the proper license, and, if not, make sure that an application is filed immediately for a renewal or a new license. One copy of this form is to be submitted to this office by not later than August 11, 1952, and a carbon copy is to be kept in your files as a constant reminder that all licenses must be current.

It is further requested that no new employee be permitted to operate our equipment unless he has a valid operator's license.

In filling in the attached form, the employee's name should be typed in the first column. The second column should list the date on which the Texas operator's license expires or "no" if the employee does not have a license. The third column should list the same information about the Texas commercial operator's license, and the fourth column should contain the usual signature of the employee.

Very truly yours,

W. W. Finley
District Engineer

WWP:bs

. . . Spare That Tree!

Landscape Section
Traffic Services Division

One of the most appreciated but least understood items along our highway right of ways is trees. There was a time not so many years ago that all trees within the right of ways were destroyed; however, when it was discovered that trees served many useful purposes such as safety promotion, erosion control, soil moisture control, and aesthetics, a determined effort was made to preserve existing trees along the right of ways and to plant in areas where none existed.

Following are some interesting highlights relating to trees or vegetation.

Roots: The shape of the tree's root system roughly resembles the shape of the tree above ground. Usually, a tree's roots grow in a circumference which matches or exceeds the circumference of the tree's outside branches.

The larger tree roots are for anchorage whereas, the smaller roots, rootlets, and root hairs are food and moisture collectors.

Fibrous roots and root hairs are usually found in the upper twelve inches of top soil. As many as 10, 000 root hairs per square inch have been found on certain rootlets.

Trunk: The stem or trunk of a tree, including its branches and twigs, has as its functions support, conduction of food and nutrients, and storage of manufactured food materials.

A tree is almost a solid column of water or sap from the roots to the leaves. Tree sap has a great tensile strength of 2, 250 pounds per square inch, which is theoretically enough to lift it to the top of a tree almost a mile high.

A limb growing from the trunk of a tree at a certain height from the ground, always remains at that same height.

Thirty to sixty per cent of the weight of green wood is moisture.

Leaves: Through the process of food manufacturing in the leaves, carbon dioxide from the air is utilized and oxygen is returned. This is the reverse process with animals, thus this exchange of oxygen for carbon dioxide makes a most ideal balance between plant and animal life.

Ninety-eight per cent of the water taken up by the roots is passed off through the leaves as vapor. Two per cent is used to build and nourish the tree. It is this moisture, thrown off in the form of vapor, that makes the shade of a tree more pleasing and comfortable than the same amount of shade by an inanimate object such as a house.

A mature American elm has approximately seven million leaves with a total leaf surface of about five acres, and on a clear, sunny day in the early growing season will evaporate through its leaves approximately 2, 000 gallons of water.

A medium-sized apple tree will take up approximately 100 gallons of water from the soil on a single summer day.

A corn stalk may take as much as fifty gallons of water from the soil in its growing season.

One acre of lush grass will take approximately 1,500 gallons of water from the soil on a hot June day.

There is more evaporation through the leaves during the early growing season than during the late summer. The amount of evaporation is controlled by pores in the leaves which expand or contract, depending upon moisture and atmospheric conditions. These pores vary with the different types of leaves but may be from 50,000 to 400,000 per square inch of leaf surface.

During a drought period a tree will shed its leaves to protect its life and to prevent taking all the moisture from the soil.

Chlorophyl, the green coloring in the leaves, is the only known element in the world which serves as the agency by which the light energy absorbed by the sun is transformed into chemical energy, in combination with water from the soil and carbon dioxide from the air.

Colored-leafed trees are not as efficient in food manufacture as those in which chlorophyl predominates. The destruction of chlorophyl in the fall due to low temperatures exposes to view the yellow pigments which results in a condensation of certain materials in the cell sap which forms the red pigments. Colored-leafed trees are invariably slow-growing trees.

Trees are not sprayed just to eliminate insects and diseases but to preserve the food-manufacturing possibilities of the leaf.

Trees are helpful, wonderful organisms that make our daily life brighter, more healthful, and pleasant. It is thoughtless to tear down or destroy those material things a person can rebuild, but how much more wanton it is to mutilate and thoughtlessly butcher or destroy that which you or any man cannot reproduce.

World's largest dogwood tree, Rusk County.

One of world's largest oak trees, Goose Island State Park.

One of world's largest holly trees, Alto, Texas.

Texas Highway Department
Form 433-B 11-51-40m

61631-1151-40m

INTEROFFICE MEMORANDUM

TO: Mr. M. V. Greer, Supervising Traffic Engineer

Date August 22, 1952

FROM: W. R. Stebbins, Jr., Traffic Designer

Responsible D-16

SUBJECT: Sign Erection and Maintenance Policies in District 1

Desk Traffic Engineering

District 1 operates on the policy of central responsibility and centralized operation for the erection and maintenance of all traffic signs. The line of authority runs from the District Engineer through the District Maintenance Engineer to the Associate District Traffic Engineer who has the direct responsibility of supervision of the sign foreman and his two erection crews and the district sign shop.

This organization was set up to obtain more uniformity and consistency in sign location and sign types throughout the district. In driving through the district it is fairly obvious that this objective has been attained. There is practically no variation among the various maintenance sections in sign location.

With the two erection crews a pride in sign placement and sign maintenance has developed. The maintenance crews traditionally considered signs only as a sideline to be bothered with only when more important work was completed. The sign erection crews have only the one objective of maintaining the highway signing as best they possibly can.

It is generally believed that the centralized sign erection and maintenance is more economical than erection by section maintenance crews. The inventory of signs required has been reduced appreciably by concentrating them at one location. Only a very few signs, particularly route markers, are required in the section warehouse as the maintenance crews only need signs for quick emergency replacement. All sign repairs necessary are reported to the central sign crew by the local section foreman and handled by the central crew.

Signing of intersections, new highways, and problem locations is planned by the Associate District Traffic Engineer. Routine standard sign placement is directed by the sign foreman who instructs the two erection crews. The production of signs in the shop is directed by the Associate District Traffic Engineer and the sign foreman.

The sign organization in District 1 includes 10 men headed by the Associate District Traffic Engineer. The sign foreman supervises the two two-man erection crews. Four men work in the sign shop manufacturing signs.

⇨

Texas Highway Department
Form 433-B 11-51-40m

61631-1151-40m

INTEROFFICE MEMORANDUM

TO:

FROM:

SUBJECT: Continued

Date

Responsible

Desk

Special equipment used by the sign organization includes a two-door sedan modified like the usual section foreman's car for the Associate District Traffic Engineer. The sign foreman has a light pick-up truck. Each of the two erection crews has a one-ton truck with a special body, constructed in the district shop, which has special compartments for sign posts, paint cans, bolts, etc., and shelves and racks for signs. The sign shop has the usual equipment and a small office for the sign foreman. The shop is a complete building unit and is not shared with any other activity.

In manufacturing signs, the shop uses metal, plywood, and wood blanks, using metal when available, and generally preferring plywood over built-up wood blanks when available at reasonable prices.

Signs are stenciled by hand with card stencils and stencil brush. Individual words, arrows, and borders are each stenciled separately with the borders stenciled in short segments. Stencil placement on the particular sign blank is guided by chalk lines on the blank.

Generally, throughout the sections of District 1 which were observed, the condition, location, and maintenance of signs were excellent. Extensive use was made of the present D-2 destination sign. An enlarged D-2 with about 8-inch letters has been developed and was used at locations where DM-1 markers would have been used in other districts. The enlarged D-2 does not obstruct sight distance as DM-1 groups usually do, and seems quite satisfactory. Two of the proposed D-1A signs used in an assembly would be about the same size as the enlargement of the present D-2.

In conclusion, then, it seems that centralized sign erection and maintenance as practiced in District 1 has definite advantages in improving the quality of signing in the District. The economic aspect probably deserves further study. However, even if such an organization is somewhat more expensive, the results will probably justify the cost.

WRS:bm

Texas Highway Department
Form 433-B 11-51-40m

61631-1151-40m

INTEROFFICE MEMORANDUM

TO: Mr. P. S. Bailey, Maintenance Engineer

Date August 26, 1952

FROM: R. Q. Spencer, Sr. Maintenance Engineer

Responsible

SUBJECT: Reply to Memo Regarding "Sign Erection and Maintenance Policies in District 1"

Desk D-3

The following comments are offered regarding the merit of centralizing sign maintenance, discussed in memo dated August 22, from Mr. W. R. Stebbins to Mr. M. V. Greer.

Although centralized sign maintenance in District 1 has produced uniform and good signing, it is felt that careful consideration should be given before recommending this departure from the principle of making the Maintenance Foreman responsible for all maintenance functions in his area. Since several other Districts are using the centralized maintenance system with varying degrees of success, I feel that the good signing in the Paris District may be attributed to their skilled and aggressive workmen and to adequate supervision more than the system they use.

There are several factors favoring sign maintenance by the Maintenance Foreman which should be considered. The Maintenance Foreman is in a better position to handle sign problems which involve public relations. He is in position to observe the effectiveness of signs, especially at intersections, and to make corrections with minimum delay. In most Maintenance Sections a man assigned the principal duty of sign maintenance is able to perform all work on signs, plus setting and painting guard posts, maintaining mail box stands, and other miscellaneous duties. Flexibility is increased by ready availability of additional manpower, and patrolling or dead-heading is held to a minimum.

It is my opinion that good signing is provided under either of these systems when adequate supervision is provided by the District Headquarters, and that the advantages of local control and responsibility make sign maintenance by County Maintenance Sections more desirable than by crews working directly under the District Headquarters.

RQS:ka

Construction of Hot

J. R. Harris, Supervisi
Construction I

This is a picture story of the various steps in constructing a level-up course using hot mix asphaltic concrete. This section of road is on U.S. 80 between Longview and Hallsville. The contractor was the Public

1. Brooming the surface to be leveled up with rotary broom to remove all dirt and trash before applying the tack coat.

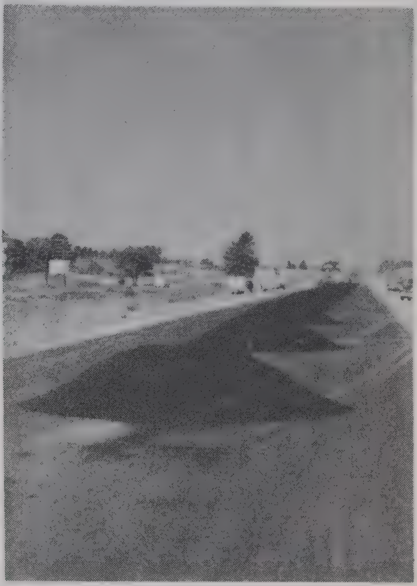
2. Applying the RC-2 Tack Coat with an asphalt distributor. This tack coat is applied at a very small rate, never more than 0.05 gallon per square yard.

3. Type D mixture is dumped in piles on the center of the roadway. Each pile is about one-third of a truck load and the piles are spaced to produce the desired rate of application.

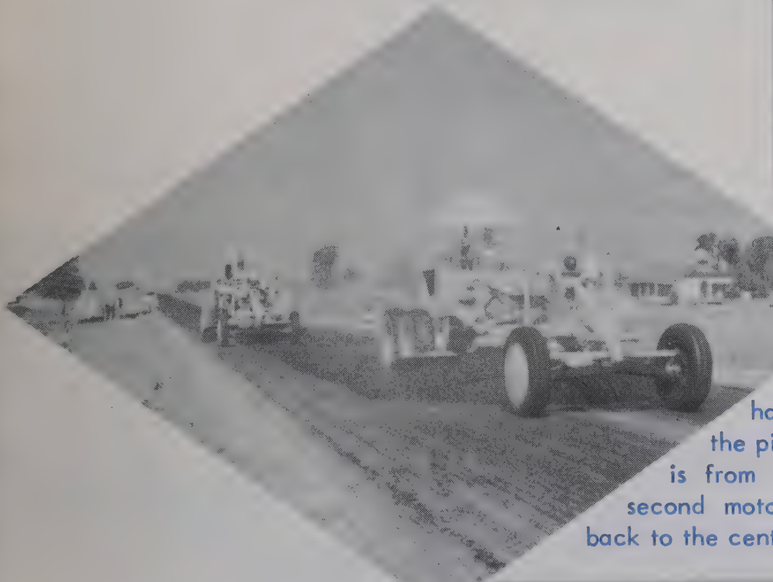
Mix Level-Up Course

Construction Engineer
ision

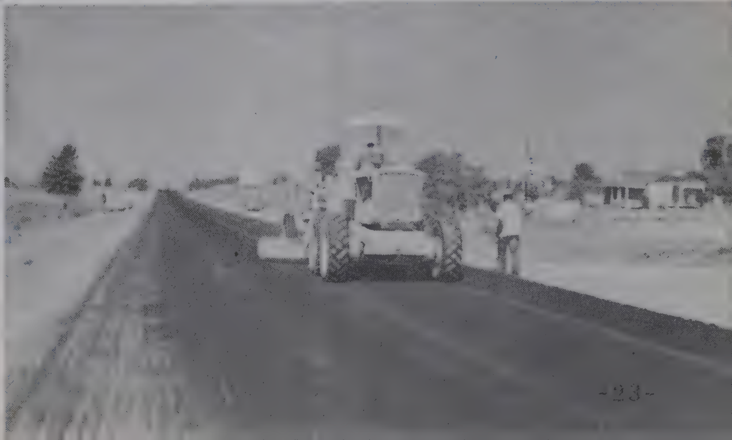
Construction Company, Lee Cartwright, Superintendent. The project was under the supervision of R. M. Bradford, Senior Resident Engineer. "Type D" Hot Mix Asphaltic Concrete was used in the level up course.



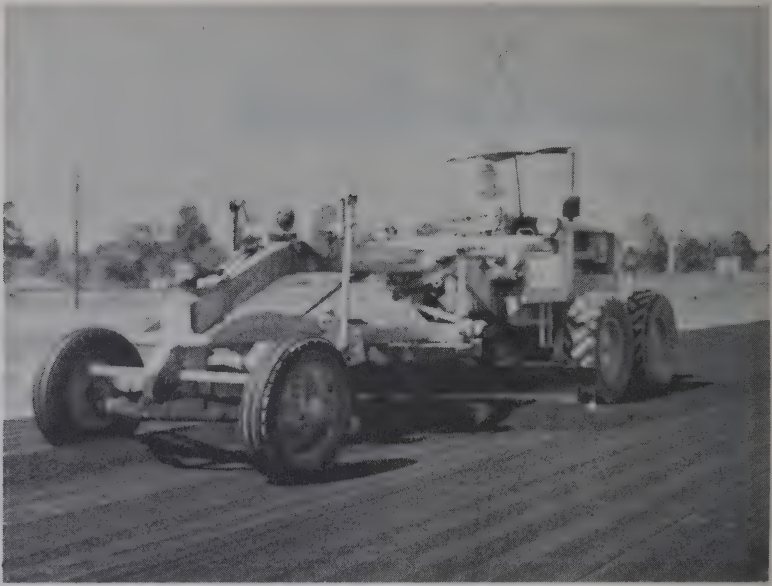
4. Shows the piles in a "Land."



5. Using two motor patrols leveling up. The first motor patrol has just completed knocking down the piles. Note how dark the front axle is from running over the hot mix. The second motor patrol is blading the material back to the center to form a windrow.

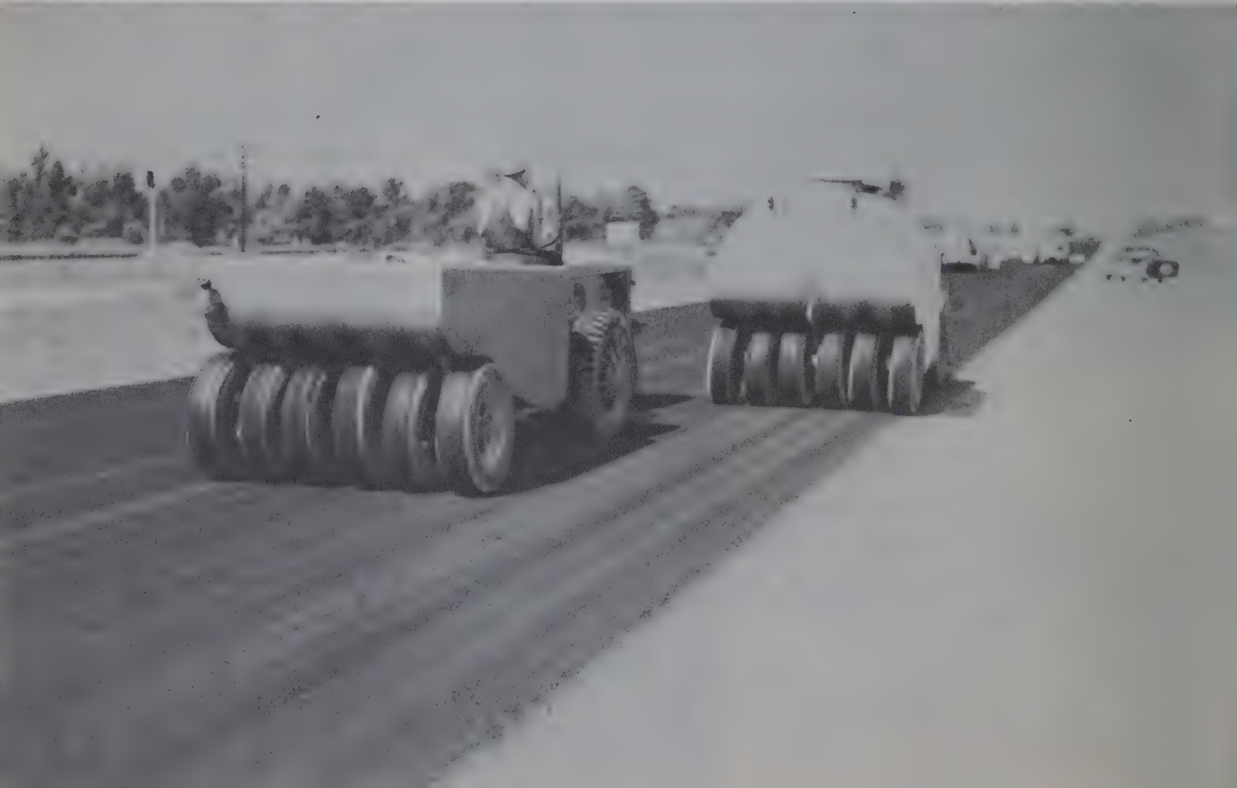


6. The uniform windrow is being divided, half of it carried to the right hand edge of the pavement.



7. Drifting small amount of hot mix over the surface of the roadway. Note the pneumatic roller marks on the right side of the pavement.

8. Pneumatic rollers following the motor patrols. When the hot mix is laid with motor patrols in small lifts, each lift is compacted with the pneumatic rollers.



9. View of the completed section ready for final compaction.

10. Using a three-axle Tandem Roller for the final compaction.

11. View of the completed level-up course which is now ready for the final machine surface course.

Bridge Repairs

69th Street Bridge, U. S. 90, Harris County

Project MC 27-10-6

P. H. Caldwell, Senior Resident Engineer
District 12

Bids were received on October 10, 1951, by the State Highway Commission for certain repairs to the 69th Street Bridge over Buffalo Bayou on U.S. 90 in Houston. This structure carries about 34,000 vehicles per day. The work consisted of removing the existing timber deck of the 133-foot bascule span, reflooring with Class X Concrete (light weight aggregate) and increasing the vertical clearance to fifteen feet. Contract for this work was awarded to Southern Contracting Company, Austin. The painting of the structural steel and the asphalt surfacing of the floor were performed by state maintenance forces.

Light weight aggregate concrete was used because it was necessary that the bascule span and counterweight continue to constitute a balanced unit under dead load only, and with the deck in place.

Preliminary investigations indicated that the dead weight of the existing flooring, consisting of alternating 2" x 6" and 2" x 7" treated timbers laid edgewise and surfaced with two inches of rock asphalt, was approximately 55 pounds per square foot. It was therefore established that the concrete should have a cured weight between 81 and 85 pounds per cubic foot exclusive of the weight of reinforcing steel.

Light weight aggregate, made from expanded clays under controlled conditions and meeting the A.S.T.M. specifications for light weight aggregates is available locally, produced by the Texas Lightweight Aggregate Company both at Stafford and Rosenberg in Fort Bend County. It was believed that a mix could be designed using these materials capable of producing a concrete meeting the seven day flexural strength requirement of 500 pounds per square inch, the 28-day compressive strength requirement of 3,000 pounds per square inch, and also the weight requirement of 81 to 85 pounds per cubic foot.

Several hand-mixed batches were made in the field laboratory prior to the time the contractor moved on to the job, in an effort to determine as soon as possible a mix design meeting both weight and strength requirements of the specifications. The factors used in these batch designs were as follows:

Fine Aggregate	Specific Gravity	1.53
Fine Aggregate	Weight per cu. ft. (Dry loose)	52#
Fine Aggregate	Per cent of Voids	46%
Coarse Aggregate	Specific Gravity	1.50
Coarse Aggregate	Weight per cu. ft. (Dry loose)	47#
Coarse Aggregate	Per cent of Voids	49%
Fine Aggregate Factor		81
Coarse Aggregate Factor		80
Water Factor		7.0 gals.
Cement Factor		6 sacks

The beams made with this design developed an average flexural strength at seven days of 537 pounds per square inch. However, the weight requirement was not met as the concrete weighed 101 1/4 pounds per cubic foot while green, falling to 99 pounds at seven days and 95 pounds at 30 days. Two ounces of vinsol resin per sack of cement were used in the mix. The beams were cured by covering with wet burlap.

The contractor moved a 16-S concrete mixer on the job the latter part of January, 1952, obtained a quantity of fine and coarse aggregate, and several trial batches were mixed in order to obtain more definite information. Batches were made using the producers recommended design and in accordance with Texas Highway Department Construction Bulletin C-11. Quantities of vinsol resin, varying from zero to four ounces per sack, were added as an air entraining agent. Considerable difficulty was experienced in determining the apparent specific gravity and unit weight of both the fine and coarse aggregate. It is believed that this was due to the absorption qualities of the materials. It was finally decided to use only prewet aggregates, with a 10 per cent absorption factor for coarse aggregate and a 30 per cent absorption factor for fine aggregate. A distinct advantage of prewetting the aggregate is that by reducing the bouyancy the time required for mixing is reduced. A total of 33 test beams and nine cylinders were made from a total of nine investigational batch designs. Six beams from Design Numbers 1 and 2 averaged only 437 pounds per square inch at seven days and 461 pounds per square inch at fourteen days, all consistently under 500 pounds per square inch. Seventeen beams made from Design Numbers 3, 3-A, 4, 4-A, and 4-B averaged 529 pounds per square inch at seven days. Five beams made from these designs were broken on the thirteenth or fourteenth day and averaged only 480 pounds while three others broken on the fourteenth day averaged 617 pounds per square inch. Two beams held over and broken on the 65th day averaged only 491 pounds per square inch. This may or may not be indicative of loss of strength with age. The results obtained from the testing of these beams and cylinders gave assurance of the possibility of meeting the strength requirements of the specifications, but were rather discouraging in so far as the weight per cubic foot requirement was concerned. All concrete made with these design batches weighed about 105 pounds per cubic foot when green and about 100 pounds at fourteen days. The cylinders had an average weight per cubic foot of 108.64 pounds at 28 days.

During the process of removing the existing flooring, all material removed from a section of floor 200 square feet in area was weighed and found to average 63 pounds per square foot. Although this was eight pounds per square foot heavier than the weight originally estimated, it was not sufficiently heavy to compensate for concrete weighing fifteen pounds per cubic foot more than the maximum weight requirement of the specifications. Field Change Request Number 1, providing for a reduction in thickness of the concrete deck from six inches to five and one-half inches, was therefore submitted and approved.

Concrete was placed on the first section of the deck on February 27, 1952. Because of the high absorption quality of the materials, water was introduced to the aggregates about two hours prior to mixing, the coarse aggregate absorbing approximately 10 per cent and the fine aggregate approximately 30 per cent. A three-sack batch was used. Since the specifications permitted the closing of the bridge to all traffic only between sunset and sunrise, paving operations on four panels of the left lane were started at 5 p. m. and completed at 8 p. m. During this time traffic in one direction was passing almost continuously over the right lane. The bridge was closed to all traffic at 8 p. m. and reopened the following day at 6 a. m. A total of 19.5 cubic yards constituted the first pour. The following afternoon the remainder of the left lane was poured, starting at 5 p. m. and completing at 7:30 p. m. a total of 18.72 cubic yards. The bridge was again closed to traffic until the following day at 6 a. m. The concrete on the left lane was permitted to cure for a period of ten days before the traffic was diverted to left lane and the work of removing the deck of the right lane was begun. The deck of the right lane was poured in one continuous operation on March 12, 1952, starting at 3 p. m. and completing at 8 p. m. a total of 37.76 cubic yards.

On the first pour, February 27, 1952, the average flexural strength of beams, after curing in water seven days, was 531 pounds per square inch. One beam left on the bridge, cured only by wrapping in paper, was 590 pounds per square inch at seven days. Cylinders, cured in water and tested on the 28th day, had an average compressive strength of 4,514 pounds. On the second and third pour, using the same materials except that they had been prewet about 24 hours, the average flexural strength at seven days was 438 pounds per square inch and the compressive strength of the cylinders was 3,014 pounds per square inch.

Four ounces of vinsol resin per sack of cement were used and when tested by the Washington Air Meter, the presence of 7 per cent air voids was indicated. The unit weight of the green concrete was approximately 96 pounds per cubic foot. Loss of weight after a period of 30 days was approximately six pounds.

Material constants used in design were as follows:

Material	Specific Gravity	Unit Weight	% of Solids
Coarse Aggregate 10% moisture	1.59	54#	54%
Fine Aggregate 30% moisture	1.54	50#	52%

The additional vertical clearance of the structure was obtained by reducing the length of the diagonal members of the overhead bracing and welding thereto new horizontal members. The major portion of this work was performed at night when the bridge could be closed to all traffic. It proceeded without misadventure.

When the work was completed, it was necessary to raise the bascule span immediately to permit the passage of a large dredge. This was accomplished without difficulty, so it was assumed that the weight of the new deck meets the requirement of a balanced unit between the bascule span and the counterweight.

* * *

NOW IS THE TIME . .

Although it may seem a little early, it is just the right time to check your tire chains. See what new cross chains are necessary to place your old chains in a first class condition. At the same time place orders now for new complete chains. Prompt shipments can be made now-----don't wait until the snow begins to fall because deliveries usually dry up at that time.

ROADS ARE BIG BUSINESS *

Address by D. C. GREER, State Highway Engineer

Mr. Chairman and members of the National Association of County Officials, I first wish to express my sincere gratification that your outstanding organization has selected this historic Texas city in which to hold your 16th Annual Conference.

As you may have suspected since your arrival in San Antonio, our State is proud of its history. Texans are also proud of recent achievements of this state and will occasionally confess the national leadership of Texas when questioned by visitors to this State.

Texans are particularly proud of this State's road progress.

The road building agencies of Texas, the counties, the cities and the State, enjoy what we feel to be a unique degree of cooperation. These three governmental agencies have built and now maintain approximately 200,000 miles of Texas streets, roads and highways, some 50,000 miles of which are paved.

The county officials of Texas have had a vast influence for better roads in this State. Similarly, the county officials of this Nation are vitally concerned with and interested in better roads for the entire nation. With that thought in mind, it is a distinct pleasure to meet with you today and to discuss a matter that is of such great mutual importance.

The American way of life is geared to the motor vehicle. As highway development has occurred, the national economy has expanded. As the national economy enlarges, our public road systems grow. There is a

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* This address was made before the Sixteenth Annual Conference of the National Association of County Officials in San Antonio

direct and distinct relationship between the prosperity of this nation and the rate of motor vehicle travel.

The linking of every corner of the nation and every segment of our society has created a national economy unparalleled in the history of mankind. Over the transportation network of roads and highway moves the commerce necessary for national prosperity.

Our road system is vital in times of peace, even more vital in time of war. Studies of industrial plants manufacturing war materiel show that 80 per cent of the parts and materials used in that manufacture move to these plants by highways. Most of the workers in these industries travel to and from the factories by highways.

The Chief of the Army Transportation Corps recently stated, "The extent of highway facilities and the condition they are in have direct bearing on the state of national preparedness."

With the exception of the war years when travel was arbitrarily restricted, traffic volume and the Nation's economy have moved steadily upward together. Both have more than doubled in the last two decades.

In view of past experience, we may expect travel to show continued expansion as our country's production continues upward. If that travel continues to increase, the consistent need for better roads will grow accordingly.

I believe that even the budget experts in Washington hesitate to use trillions in their figuring. Most of us have trouble visualizing millions, much less billions. But there is a new road statistic we must now recognize: this year Americans will travel a half-trillion vehicle-miles.

That enormous figure--and it is indeed enormous--demonstrates the true value of roads to our people.

As our road system has grown, so has the construction industry. Last year was a record one in this field. Total construction amounted to over 39 billion dollars, placing construction at the top of all our national industries. The value of all agricultural and livestock sales for the year were 37-1/2 billion dollars.

Public road construction makes up an important part of this yearly construction total. Disbursements for local roads and highways will again exceed 4 billion dollars this year, having first surpassed that figure in 1950.

An examination of all expenditures for all types of roads since 1920 establishes that roads are indeed big business. They are big business now, they are increasing in scope, and if we are to adequately serve the people of this nation, our public road system must be quickly improved on a scale far in excess of previous accomplishments.

I believe you would be interested in the relative increases in expenditures for local roads in this nation over the past three decades. In 1920 disbursements for local roads amounted to $29 million, in 1930 they had increased to $200 million, and by 1940, to $333 million. In 1950 over $1 billion was spent on construction and maintenance of county and local roads.

Thus, within 30 years, the expenditures for these roads have increased to 35 times their former amount! Disbursements for state highways have also increased during this same 30-year span of time. Whereas we invested $324 million in state highways in 1920, that amount had grown to $2.4 billion in 1950, approximately 8 times its former amount.

However, it is now apparent that even with the greatly increased disbursements for construction and maintenance of public roads, this nation's road officials will be unable to meet the traffic demands of this country.

Four factors of modern-day traffic make our present construction funds inadequate, even though these funds have increased over the years. These factors are the increases in the number of motor vehicles, the speed of travel, the sizes and weights and the use of the individual vehicle.

In 1921 there were 11 million motor vehicles in the United States. We now have over 52 million motor vehicles registered in this nation, and that number is being increased at the rate of 6% each year. In recent years the average rate of speed and the average use of the individual motor vehicle has increased tremendously, but perhaps the most recent and most important factor contributing to the inadequacy of our national road system has been the increase in the sizes and weights of the vehicles using this system.

Truck traffic during the last decade has shown a phenomenal growth. In 1920 there were 1 million trucks registered in this country. In 1941 these registrations had grown to almost 5 million, and within the last ten years have almost doubled again. At the present time, approximately 10 million trucks are registered, and truck traffic amounts to 137 billion ton-miles each year. The truck ton-mile figure today is over three times its pre-Pearl Harbor level!

While all parts of the nation are dependent upon truck traffic to carry a major part of the load of modern commerce, we in Texas have perhaps an even greater dependence on this particular medium. Large sections of this State have no means of transportation other than by highway.

Yet the increase in the ability of carriers to move freight by highways has not been an unmixed blessing. The county officials and state officials are concerned about the additional loads that are placed upon the already overburdened road system.

The engineering solution to the problem of heavier loads would be to provide more massive structures, both roads and bridges. Present construction revenues will not permit this remedy. Load zoning and a reasonable legal maximum on sizes and weights must serve until we are able to provide more adequate travelways for motor freight.

When the four factors of the road traffic problem are added, we find that our transportation plant is simply no longer able to cope with the situation. The shrinkage of the road dollar through inflation has cost us gains that might have otherwise been possible. At the present time our national road dollar will buy only 43 cents worth of construction compared to the 1940 highway dollar.

With the growing obsolescence of our public roads has come an increase in the maintenance funds necessary to hold the line. These maintenance costs, both county and state, increased over 85 million dollars between 1951 and 1952.

In order to understand the real reason for this problem, it is necessary to recall the early years of roadbuilding. We remember that in the '20s and early '30s our main problem was to pave the main arteries between the major cities. Most of our original highway work was done in those early years and was designed for traffic light in weight and light in volume. Thousands of miles of these early highways are still under traffic today all over the nation, even though modern traffic has made them into death-traps.

The greatest penalty for inadequate roads--aside from the adverse effect on our Nation's transportation ability-- is the mounting tide of motor vehicle accidents.

Last year over 37,000 persons were killed and one and one-fourth billion dollars in property damage lost through motor vehicle accidents in the United States. This national tragedy is compounded by the fact that many of these lives could have been saved, much of the property loss avoided, had our highways and roads been adequate.

It is an ironic fact that the cost of insurance on motor vehicles is roughly that of all state gasoline taxes and vehicle registration fees in this country.

Since the Chairman of your Roads and Highways Committee was scheduled to give you a factual report concerning the proposed Federal Aid Highway Act of 1952, I shall make only a brief reference to it. As passed by the House, this Act will provide approximately 10 per cent more Federal Aid funds for each of the three categories of Federal Aid roads, namely, Urban, Primary and Secondary.

It would seem from the provisions of the proposed Federal Aid Act that the National Congress, in its wisdom, feels that all of the three categories of highways and roads should receive more financial support from the national level. In this all road officials will concur. As county officials you are, of course, most concerned with the Secondary program. Under the new Act, the Secondary Road System should continue its present rapid expansion.

Upon passage of the first post-war Federal Aid Highway Act, the national government for the first time provided funds specifically for secondary roads. The State of Texas, which needs secondary roads most desperately, was the first State to complete a road under that program. It has been our purpose to continue that leadership ever since. In the few years since the end of World War II, Texas has built or has financed for early construction over 20,000 miles of paved Farm to Market roads.

My personal opinion of the proposed Federal Aid Act is that it is inadequate in each of the three categories, especially so in the section allocating funds to the Primary System of Federal Aid Highways. We must remember, however, that the National Congress is confronted by complex and difficult problems and must balance the needs of the country against its financial ability.

Taking stock of the 3 million miles of public roads in this country, we do not get a completely gloomy picture. Inadequate as our national road system certainly is, it is rendering service to this nation on a scale which very few citizens realize. Responsible agencies have estimated that over $20 billion was spent in travel in the United States during 1951. This is a sum equal to about one-twelfth of the entire national income.

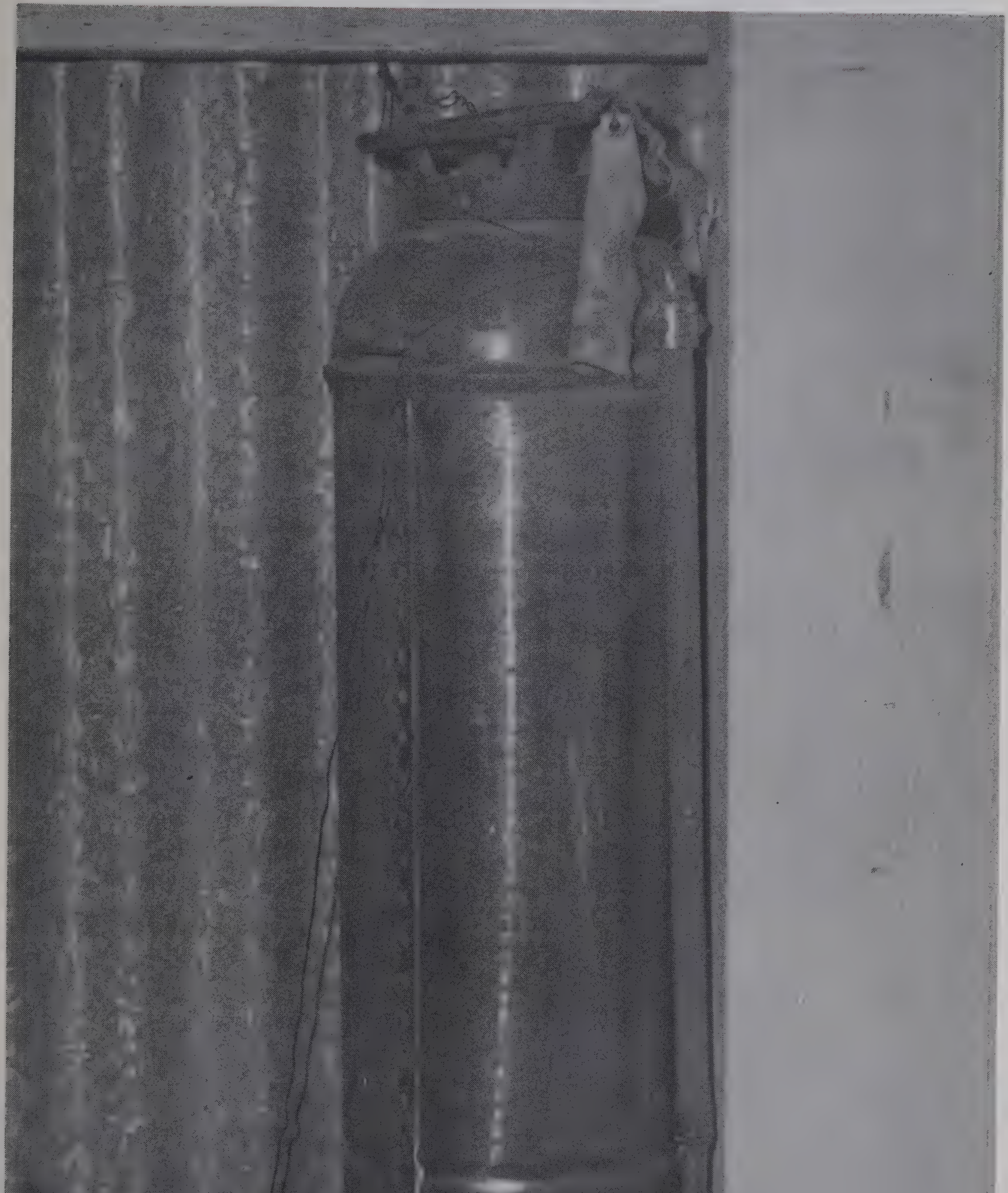
This money enters the channels of trade in the various communities through filling stations, hotels, motels, restaurants, retail stores and the like. It goes on from there to create a market for utilities and goods, to pay taxes and to meet payrolls.

Several major national industries are completely dependent upon highways and roads. These industries are aware of the problems now faced by road officials and anxious to aid in solving these problems.

In summary I would like to again point out that our roads and highways are today carrying immense traffic of enormous importance to our country's continued prosperity. As public road officials it is our responsibility to provide the best and the most possible roads with the funds we have available. These roads are now providing outstanding service in view of their limited ability.

As public officials, we must use all our knowledge and all our vision on this nation's road problems, because-- from any standpoint-- Roads are Big Business.

Wired for Quick(?) Use



INSTRUCTORS SCHOOL

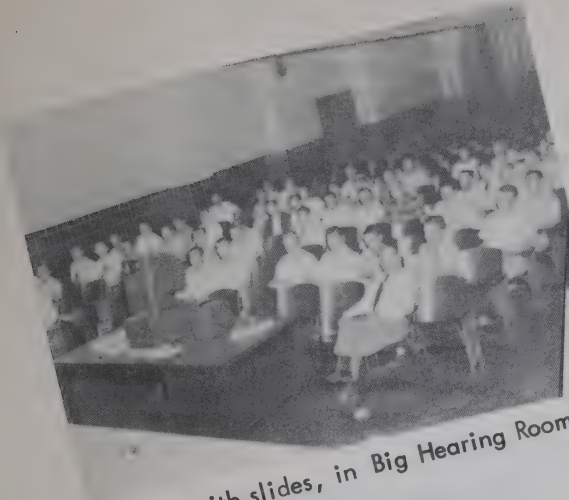
For Construction Inspection

The first of a series of Instructors Schools was held in Austin during the early part of September, 1952. The School was conducted by the Construction Division and dealt with the design and control of Hot Mix Asphaltic Concrete. Class sessions were held in the big hearing room of the main building while laboratory procedure was demonstrated and practiced at Camp Hubbard. Olof Philippi, Assistant Construction Engineer, and Dick Harris, Supervising Construction Engineer, were the principal instructors.

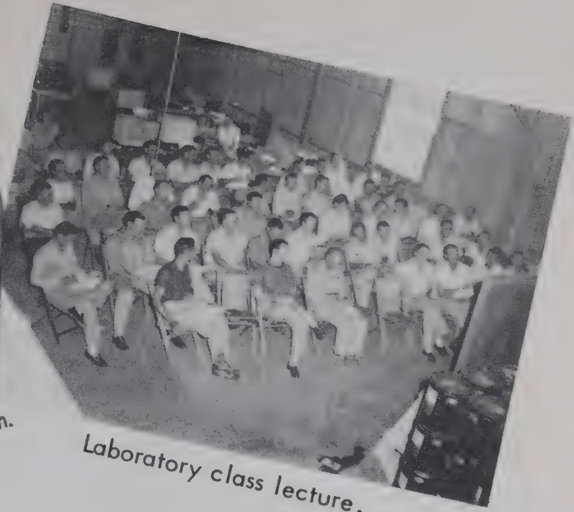
The school on Hot Mix Asphaltic Concrete was opened on September 8, 1952 by Jed N. Robinson, Construction Engineer. Thomas C. Collier, Assistant Highway Engineer, welcomed the group which was comprised of representatives of each highway district and expressway, as well as representatives from the U.S. Army Corps of Engineers. Herbert Eldridge, Chief Engineer of Planning, John Waller, Chief Engineer of Construction and Maintenance, and Howard Arno, Director of Personnel, were introduced to the group.

Upon termination of class work in the main building, D. C. Greer, State Highway Engineer, spoke to the school congratulating them on their efforts in assisting in solving the problem of shortages of competent inspectors and trained engineering personnel. The present volume of awarded contracts plus future awards will require the continuation of the policy of training our own construction inspection forces throughout the state.

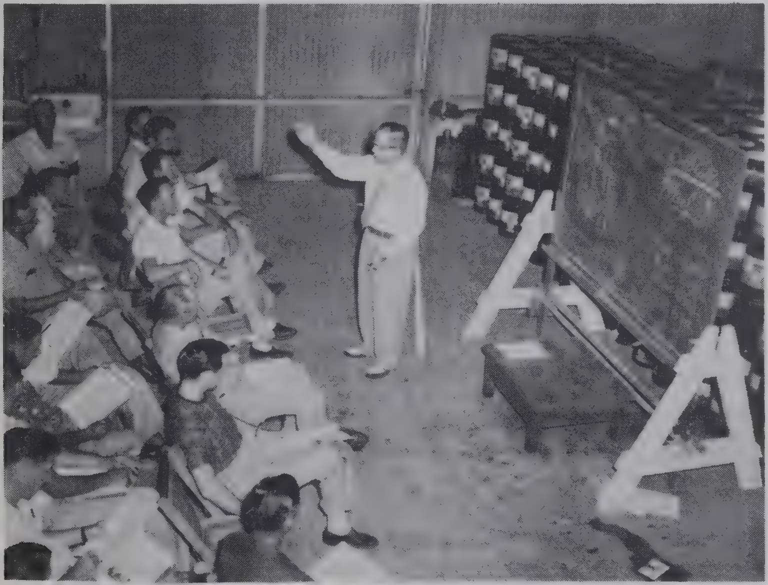
Other Instructors Schools are to be held in Austin following a plan approved by Mr. Greer upon the recommendation of Messrs. Frank Maddox, Assistant State Highway Engineer, Herbert Eldridge, and John Waller. Mr. Greer assigned Howard Arno to coordinate the training program, which envisions the training of key personnel from all of the districts and expressways in Austin as Instructors. Those instructed in Austin in uniform construction practices, latest techniques, and recommended procedures will act as instructors in their respective districts and expressways.



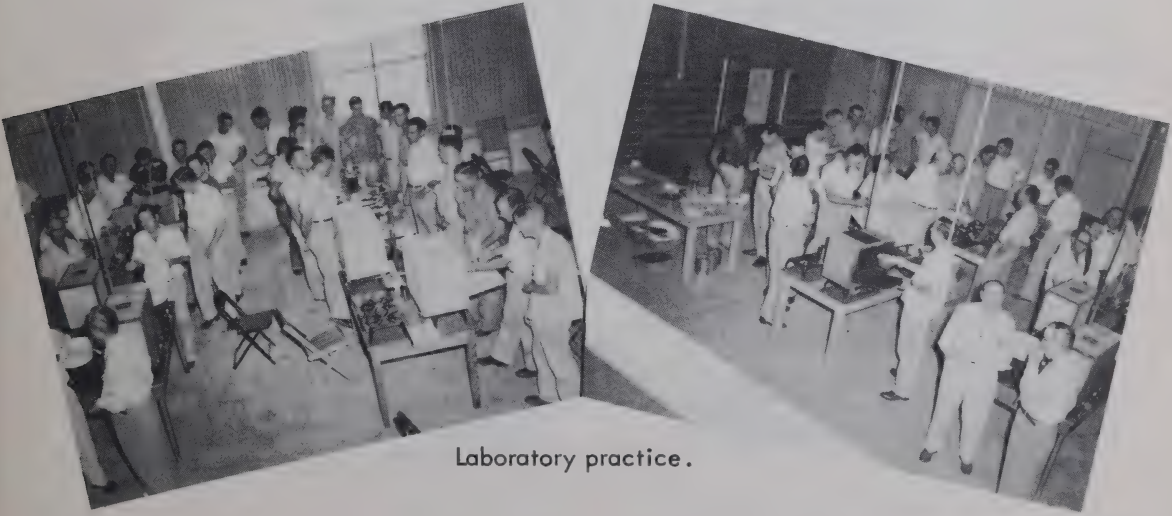
Lecture with slides, in Big Hearing Room.



Laboratory class lecture.



Olof Philippi, the old professor, wound up . . .



Laboratory practice.

ATTENDANCE AT THE
HOT MIX ASPHALTIC CONCRETE TRAINING SCHOOL
September 8 through 12, 1952

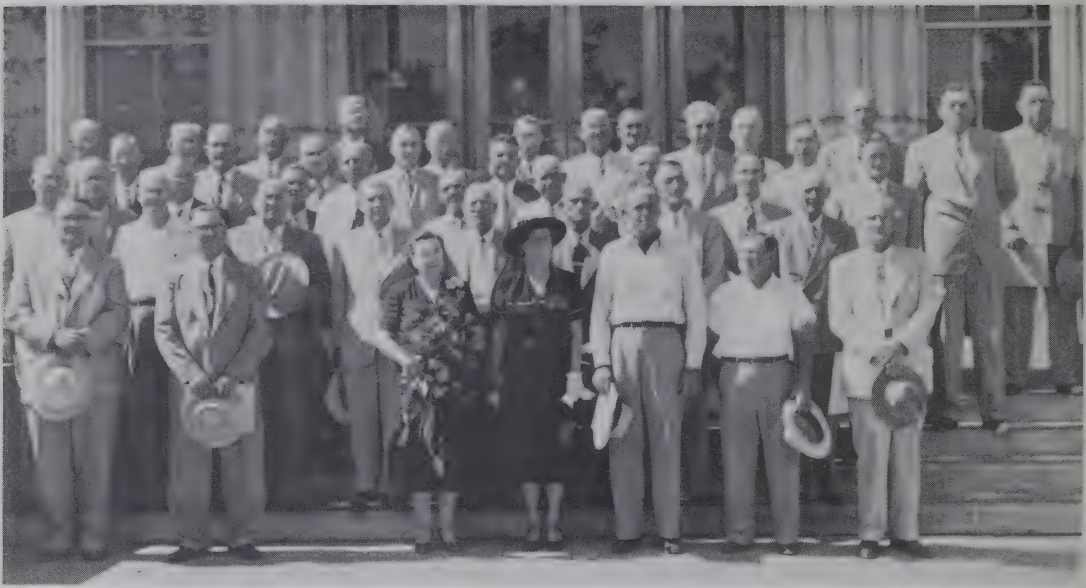
Urban Project or District	Name of Employee	Title
District 1	Richard L. Stauter	Resident Designer
	W. J. Thomas	Senior Inspector
District 2	James E. Kelly	Associate Resident Engineer
	J. R. Mercer Jr.	Associate Resident Engineer
District 3	Melville C. Hicks	Senior Inspector
	Leiland L. Jett	Engineering Assistant
	John Maroney Jr.	Engineering Assistant
District 4	Richard C. Crandall	Chief Inspector
	Louis A. Wehrman Jr.	Senior Inspector
District 5	Herbert E. DeShazo	Senior Resident Engineer
District 6	J. P. McKelvy	Associate Office Engineer
District 7	W. P. Fulgim Jr.	Senior Inspector
	Gerald G. Lackey	Associate Resident Engineer
District 8	R. L. Daugherty	Resident Inspector
	A. L. McKee	Senior Party Chief
District 9	George G. Cleveland	Senior Instrumentman
	Clarence J. Janak	Chief Inspector
District 10	David W. Hogan	Senior Draftsman
District 11	Lynn S. Hill	Engineering Assistant
District 12	Thomas C. Snedecor	Resident Inspector
	H. G. Taylor	Chief Inspector
District 13	P. J. Laas Jr.	Engineering Assistant
	Carl V. Ramert	Associate Resident Engineer
District 14	H. C. Carter	District Construction Engineer
	D. J. Korczinski	Chief Inspector
	Allen R. Steves	Engineering Assistant
District 15	Emil E. Seewald	Associate Resident Engineer
	Louis E. Youngblood	Senior Party Chief
	Meredith M. Peters Jr.	Chief Inspector (Expressway)

(Continued)

Urban Project or District	Name of Employee	Title
District 16	James B. Opiela	Engineering Assistant
District 17	Robert H. Schleider Jr.	Engineering Assistant
District 18	Harold D. Glass	Senior Party Chief
	Perry P. Moss	Associate Resident Engineer
District 19	R. E. Burns Jr.	Resident Engineer
	Howard D. Moore Jr.	Chief Inspector
District 20	C. H. Brown	District Construction Engineer
District 21	June T. Martin	Senior Resident Engineer
District 22	C. N. Parsons	Assistant District Engineer
District 23	Temple R. Kennedy	Senior Draftsman
District 24	Jack G. Dumas	Senior Party Chief
District 25	John F. Nixon	Senior Inspector
Houston Urban	Don L. Wells	Chief Inspector
Dallas Urban	John G. Keller	Senior Urban Engineer
Ft. Worth Urban	Justin M. Bingham	Resident Inspector
D-3	Roger Q. Spencer Jr.	Senior Maintenance Engineer
D-6	W. L. Garrard	Office Engineer
	Kenneth C. Newell	Junior Clerk
	J. D. French	Supervising Construction Engineer
D-8	J. E. Power	Designing Engineer
	Paul Bing Griffith	Designing Engineer
D-14	Gerald M. Clopton	Senior Designing Engineer
U.S. Army Engineers	Edward F. Maddox	Constr. Management Engr., Dallas
	Adron Gambrell	Construction Engineer, Galveston
	E. H. Gohmert	Construction Engineer, Ft. Worth
	Charles W. Mitchell	Materials Engineer, Dallas
	Donald L. Reininger	Construction Engineer, Galveston
	Billy J. Wallis	Paving Engineer, Bergstrom AFB

AWARDS. . .

25, 30, AND 35 YEAR AWARD WINNERS . . .

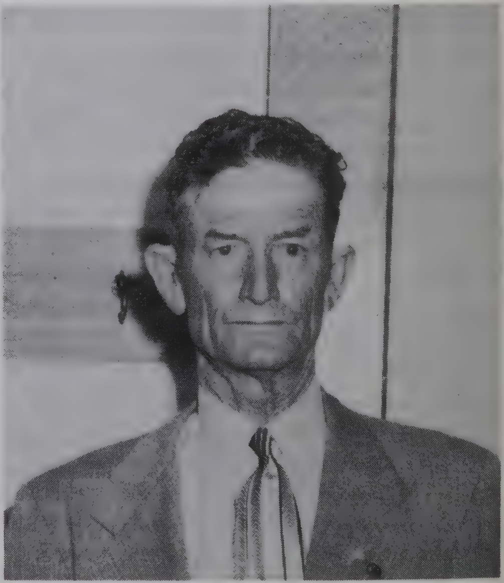


Back row: George W. Achterberg, William C. Bushfield, Wiley R. Custer, Frank E. Lovett, E. J. Amey, T. Frank Barr, J. Frank Blair, Guy M. Brown, Marvin L. Brown, and Waymon L. Burns.
Fourth row: Milledge A. Cox, Virgil M. Craven, Herbert T. Cunningham, Ellis Fite, Elmer Flach, Johnnie Gentle, Tom Griffith, Erwin R. Gunter, and J. Leslie Hamilton.
Third row: Robert E. Johnston, Otis A. Keith, A. David Lopez, Jim Layman, Porter McCarroll, John Matthews, Arthur H. Morgenroth, Lonnie R. Nail, and John B. Northcut.
Second row: W. Dewitt Palmore, Albert H. Pollard, Herbert Puckett, Ralph R. Renshaw, Walter Rucker, Erwin Simon, Homer V. Southerland, and Erskin R. Stephens.
Front row: Oscar L. Stewart, Lonnie K. Taylor, Bessie Bergstrom, Myrtle Boatright, Tilmon W. Warr, Garland W. White, and Thomas I. Wright.

SAFETY AWARD . . .

Recently, John B. Northcut was presented an award in Austin for safe driving. Northcut was employed June 13, 1927 as Truck Driver; qualified for 14-year Truck Driver's No-Accident Award under rules of Insurance Division as of December 31, 1951, and has maintained perfect record for 1952 up to date. This man was exposed to the greatest hazards of highway maintenance during this period as his work consisted chiefly of Asphalt Surface repairs, transporting crews, tools and materials.

Northcut is an excellent truck driver and equipment operator. We estimate the cost of operation of equipment assigned to him at less than 50 per cent of the average.



"Comments From the Traveling Public"
OVER THE HIGHWAYS

. . . You need more signs telling how many miles to next series of towns . . .

Norman, Oklahoma

. . . Your beautiful roadside stops need to be checked more frequently for cleanliness . . .

Ralph W. Ceoffi
Alameda, California

. . . I don't like the black line on highways. You can't see it when it is raining, especially at night . . .

Ventura, California

. . . When one highway branches into another, you should have signs on both highways -- especially highway numbers . . .

Ontario, California

. . . We like your little roadside parks very much, but there should be more of them, and if possible, with drinking water! . . .

Omaha, Nebraska

. . . Garbage containers at roadside parks breed flies which practically drive you away from the tables. Suggest a hinged cover of metal . . .

Phoenix, Arizona

. . . Signs on roads to find your way are much easier to find in our home country. You have "prima" roads! . . .

Hermann E. Reisner, Publisher of
Overseas Post
Nuernberg 2, West Germany

. . . Your signs are hard to follow regarding highway numbers. When approaching a town, you see the highway number with arrows pointing both directions. You don't know if you should turn right or left, especially at night . . .

Oklahoma City, Oklahoma

I have been intending to write you for some time to tell you how much I am enjoying and appreciating the receipt of Construction & Maintenance Bulletins. From time to time we have found very valuable articles in the Bulletin and in fact, we now have one of them on a tour of our District Offices . . .

Sincerely,

Don Lee
Chief, Soils & Paving Section
Civil Aeronautics Administration

Have just returned from a vacation trip which covered about 6,000 miles in ten western states, and I want you to know how proud I am of our own Texas Highway Department. Not one of the states visited had highways to compare with ours on such points as width of pavement, condition of pavement, width and condition of shoulders, bridges, highway signs and markers, not to mention roadside parks which are such a convenience and so plentiful in Texas.

Another thing for which our Highway Department deserves credit is the way in which repairs are made with a minimum of annoyance to travelers. In Texas repairs are made quickly and without delay, whereas in many places there were signs indicating "Road under Construction" and the roads were torn up, but no men or equipment were working on these roads.

Again I say, you are doing a fine job and we are proud of you.

Rev. John B. Duesman
Abilene, Texas

The Wild, Wild West?

. . . I am interested in knowing if it is safe to travel these roads (118 south from Alpine and 67 south from Marfa to Presidio) without danger of possible banditry; if not will I be able to organize an armed safari in Marathon, Alpine, or Marfa?

(Signed)
Jacksonville, Florida

. . . We think your revolving fireplaces which we first discovered on 84 out of Abilene are the cleverest thing yet. We like, too, the parks with at least three trees, and the ones where you thought to chain the garbage container to a post or tree so the bears couldn't tip it over . . .

(Signed)
Fort Worth, Texas